COURSE OUTLINE

(1) GENERAL

SCHOOL	Department of Informatics and Computer Engineering		
ACADEMIC UNIT	University of West Attica		
LEVEL OF STUDIES	Undergraduate		
COURSE CODE		**SEMESTER**	**B**
COURSE TITLE	Mathematical Analysis II		
INDEPENDENT TEACHING ACTIVITIES if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits		**WEEKLY TEACHING HOURS**	**CREDITS**
	Lectures	2	
	Tutorials	2	
Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).		4	5
COURSE TYPE general background, special background, specialised general knowledge, skills development	General Background		
PREREQUISITE COURSES:			
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (in English)		
COURSE WEBSITE (URL)	https://eclass.uniwa.gr/courses/ICE257/		

(2) LEARNING OUTCOMES

Learning outcomes

The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.

Consult Appendix A

- Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area
- Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B
- Guidelines for writing Learning Outcomes

The aim of the course is to prepare the students to understand the type of a differential equation and to solve several types of first order differential equations. They will also be able to solve linear equations of higher order with constant coefficients. The students will learn to use the Laplace transform in order to solve differential equations and systems of differential equations. They will be also introduced to the Fourier and Z transformations, to the notion of the transfer function and to the solution of difference equations.

General Competences

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

Search for, analysis and synthesis of data and information, with the use of the necessary technology	Project planning and management Respect for difference and multiculturalism Respect for the natural environment
Adapting to new situations	Showing social, professional and ethical responsibility and sensitivity to gender issues
Decision-making	Criticism and self-criticism
Working independently	Production of free, creative and inductive thinking
Team work	

Working in an international environment	……
Working in an interdisciplinary environment	Others… …….
Production of new research ideas	

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Decision-making
Working independently
Team work
Working in an international environment
Respect for difference and multiculturalism
Production of free, creative and inductive thinking

(3) SYLLABUS

- Differentials equations (DE). Fundamental notions, general and partial solution of a DE, order of a DE, problems of initial values.
- First order differential equations
- Linear DE of higher order with constant coefficients. Characteristic polynomial.
- Laplace transform. Definition, properties and theorems.
- Inverse Laplace transform. Solution of DE with Laplace transforms.
- Fourier Series, trigonometrical and exponential forms. Evaluation of Fourier coefficients.
- Fourier series extention. Introduction to Fourier transform.
- Inverse Fourier transform. Properties of the Fourier transform and applications.
- Z transform. Definition, Z transform of basic functions.
- Properties and theorems of Z-Transform. Inverse Z transform.
- Solution of Difference Equations wit the use of Z transform.

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY, Distance learning, etc.	Face-to-face
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Use of ICT in teaching, communication with students
TEACHING METHODS The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non-directed study according to the principles of the ECTS	**Activity** / **Semester workload** Lectures: 39 Tutorials: 26 Project: 20 Non-directed study: 40 Course total: **125**
STUDENT PERFORMANCE EVALUATION Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students.	Written examinations with open questions in Greek language. Every question in the exam paper has a mark weight that is announced in advance to the students.

(5) ATTACHED BIBLIOGRAPHY

1. Απειροστικός Λογισμός, Briggs, Cochran and Gillett, Παν. Εκδ. Κρήτης, 2018.
2. Ανώτερα Μαθηματικά για Μηχανικούς, Erwin Kreyszig, Εκδόσεις Τζιόλα.
3. Γενικά Μαθηματικά, Βρυζίδης, Μακρυγιάννης, Σάσσαλος, Σύγχρονη Εκδοτική, 2016.
4. Γενικά Μαθηματικά, Μασούρος Χ. Τσίτουρας Χ., Εκδόσεις Τσότρας.
5. Ανώτερα Μαθηματικά, Μυλωνάς Νίκος Εκδόσεις Τζιόλας.
6. Απειροστικός Λογισμός Ι, Finney R.L., Weir M.D., Giordano F.R., Παν. Εκδ. Κρήτης.

Related scientific journals:

- Journal of Mathematical Sciences
- Journal of Differential Equations
- American Journal of Mathematics